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Crystal Structure of the Extracellular Domain of a Human Fc Gamma RIII

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ABSTRACT: Fc receptors play a major role in immune defenses against pathogens and in inflammatory processes. The crystal structure of a human immunoglobulin receptor, FcgammaRIIIb, has been determined to 1.8 A resolution. The overall fold consists of two immunoglobulin-like domains with an acute interdomain hinge angle of approximately 50 degrees. Trp-113, wedged between the N-terminal D1 and the C-terminal D2 domains, appears to further restrict the hinge angle. The putative Fc binding region of the receptor carries a net positive charge complementary to the negative-charged receptor binding regions on Fc. A 1:1 binding stoichiometry between the receptor and Fc was measured by both the equilibrium and nonequilibrium size-exclusion chromatography. Two separate parallel dimers are observed in the crystal lattice, offering intriguing models for receptor aggregation.